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Rappelons que l'auteur est un géographe français connu au Canada. Depuis 1949, à plusieurs reprises, il a assuré des services appréciés d'enseignement à l'Institut de géographie de l'Université Laval. Comme thèse principale de doctorat ès lettres, il vient de publier aux Presses de l'Université Laval un remarquable ouvrage sur les limites du peuplement dans l'Est du Canada.[2] Pour aller au détroit d'Hudson, en 1962, il a bénéficié des services d'une expédition patronnée par le C. E. N. et dirigée par M. Benoît Robitaille.

Voici ce que l'étude périglaciaire du professeur P. Biays apporte sur le plan des connaissances. D'abord des informations de géographie régionale concernant par exemple les types de relief, le rôle de la tectonique, les vagues de reprise de l'érosion fluviale, le problème de l'abrupt à l'amont des fjords. L'ouvrage de M. Biays fournit de nombreux commentaires astucieux sur les processus périglaciaires notamment en ce qui concerne le dallage, les coulées de gélifluxtion et la dynamique des dépôts de pente. L'étude comprend également deux cartes monographiques du périglaciaire du détroit d'Hudson dans les sous-régions des fjords de l'Ouest et du mont de A. P. Low. La contribution à la science est donc considérable.

Pourtant, la tâche n'était pas facile. La géographie d'exploration, dans cette région, cause de nombreux problèmes : insuffisance des documents livresques et cartographiques ; difficultés d'accès ; nombre très réduit des beaux jours ; durée insuffisante des séjours aux postes ; impossibilité de retour sur les lieux. Il est même étonnant, que, dans ces circonstances, un mémoire de cette ampleur ait pu être préparé. Heureusement qu'une étude approfondie des photos aériennes est venue compléter les observations « préliminaires » faites sur le terrain.

Parmi les problèmes étudiés, l'auteur s'est arrêté de préférence sur les coulées et les éboulis. Cela nous semble un choix judicieux, compte tenu du relief régional et des conditions de travail. Il aurait cependant été utile d'avoir plus de données sur le périglaciaire sédimentologique, en l'occurrence sur les turbations des dépôts soliflués. De plus, il faudrait, croyons-nous, atténuer le jugement porté sur le rôle des glaces flottantes, déclaré « vraiment négligeable » ; par exemple, comment interpréter les très nombreux blocs qui parsèment certains estrans? Pour nous, il s'agirait de sédiments glaciels.

Les références sont relativement abondantes. Aux ouvrages généraux sur le périglaciaire, la mention du *Biuletyn Peryglacjalny* aurait pu avoir sa place. Du côté canadien, le rapport de l'expédition fédérale au détroit d'Hudson, l'article de R. J. E. Brown sur le pergélisol, les travaux récents de Denis Saint-Onge sur les niches auraient pu être de quelque utilité. La présentation du manuscrit est bonne ; le texte est clair et bien charpenté. Les illustrations sont nombreuses et bien choisies ; cependant, il aurait été préférable d'avoir des échelles sur toutes les photos, terrestres ou aériennes (qui ont été réduites). Certains phénomènes, presque nouveaux, auraient dû être accompagnés de croquis. Inconvénients mineurs, les deux douzaines de fautes de frappe.

Bien que les conditions de recherches n'aient pas permis de présenter des « observations » plus quantitatives, le mémoire de M. Pierre Biays offre beaucoup d'intérêt. Ce qu'il est dit des coulées de gélifluxion et des dépôts de pente — les deux principales questions — mérite d'entrer dans la littérature périglaciaire générale.

Louis-Edmond HAMELIN

EYRE, S. Robert. **Vegetation and Soils, a World Picture.** London, Edward Arnold (Publishers) Ltd., 1963. 324 pages, illustrations, maps, appendices, indices, short bibliography.

The publication of this book was a delight and a surprise to biogeographers, especially to those teaching a course in biogeography. To the knowledge of the reviewer, this work is the only one of its kind available. On the one hand, it combines vegetation and soils, two of the major components of biogeography. On the other hand, it treats real vegetation and real soils ; it is not devoted to concepts and principles. In this sense, it is a radical departure from

[2] Voir également notre compte rendu dans le présent fascicule des *Cahiers*.

other recent biogeography texts, such as that of Dansereau and that of Polunin.[1] This does not mean that the book ignores concepts. Several conceptual themes run through the entire text. Notable among these are (1) the emphasis on the nutrient cycle and (2) the interpretation of vegetation with reference to the climatic climax.

The arrival of the book was all the more surprising because the author was theretofore apparently little known to North American geographers. Mr. Eyre is lecturer in the Department of Geography at the University of Leeds ; he obtained his doctorate at the University of Sheffield in 1953.

The format of the volume is somewhat old-fashioned by North American standards, but it is not unpleasant. Photographs are limited in number, and many of them are quite old and poor in quality. The use of an early photograph is no doubt justified in the case of the prairie, which can scarcely be found any longer ; but one is hardly obliged to go back as far as 1903 to get a representative view of the Boreal Forest ! The cover of the book, at least of those copies distributed in Canada, has warped rapidly. One consolation is the excellent quality of the paper. It is thin without being translucent and smooth without being glossy. The latter makes for comfortable reading.

The volume includes an appendix of black-and-white vegetation maps covering the world. There are two double-page maps for most continents. The form of many of the symbols is imaginative, but the overall visual effect leaves much to be desired. In short, the maps are extremely hard to read. A second inconvenience is that the names of the categories on the maps do not always correspond with the names used in the text. For example, « Sage brush, chaparral, etc. » shown on the maps is treated in the text under « Semi-desert scrub and woodland. » The beginner will no doubt have considerable difficulty in matching them up.

The basic framework of the book is essentially physiognomic ; that is, the chapters correspond for the most part to types of vegetation according to its form, structure, and seasonal variation. The following are the types of vegetation treated :

Coniferous Forests
Mixed Forests of Middle Latitudes
Broad-Leaved Forests of Middle Latitudes
Tundra and Alpine Vegetation
Grasslands
Woodlands and Scrublands (including semi-deserts)
Tropical Rain Forest
Tropical Seasonal Forest
Tropical Thorn Forest, Semi-Desert and Desert
Tropical Savanna
Vegetation of Tropical Mountains

In general the corresponding zonal soil types are treated in the same chapter with the particular kind of vegetation.

From an ecological point of view, this physiognomic plan involves considerable inconvenience. First, ecologically dissimilar types of vegetation are often treated in the same chapter, sometimes even in the same section. The subarctic Boreal Forest and the subtropical Southern Pine Forest are treated in the same chapter ; the broad-leaved evergreen forest of the humid subtropics of Japan and the eucalyptus woodlands of Australia are found in the same section. This is not an extremely serious problem because the author does not pretend that the types treated together are ecologically similar. In some cases he clearly shows the ecological distinction in question. Second, ecologically similar types are widely separated in the book if they happen to be dissimilar physiognomically. For example, the coverage of the Mediterranean woodland, savanna, and chaparral — very closely related ecologically — is dispersed among the following sections : « Evergreen Mixed Forests » (pp. 70-74), « Broad-Leaved Evergreen Forest » (pp. 84-86), and « Sclerophyllus Formations » (pp. 126-129). This problem is

[1] DANSEREAU, Pierre, *Biogeography*. New York, Ronald Press Co., 1957.
POLUNIN, Nicholas, *Introduction to Plant Geography*. New York, McGraw-Hill, 1960.

not insurmountable either because, in an ecologically oriented course, the professor can simply require his students to skip around in the book. If the book is used in this way, of course, the continuity of the text is broken and the ecological similarity involved does not become evident.

In addition to the chapters on the types of vegetation cited above, there are also chapters on « Vegetation Development » and « Soil Development. » The first is a condensed survey of plant synecology, or phytosociology, and the second is a brief outline of pedology. The author has done a commendable job of condensing the salient points of these systematic disciplines into a readable text which is understandable to those having no prior training in the subjects concerned. A large part of the book (Part III) is devoted to the vegetation and soils of the British Isles, and this is no doubt one of the best sections of the volume.

This book is clearly a work of geography even though it does not claim by its title to be so. It attempts to analyze the vegetation of the world together with the soil which goes with the particular type of vegetation. The author mentions the ecosystem, which he calls the « biotic complex, » but the book is not written from the point of view of this concept. In general the author treats vegetation and soils separately in the conventional manner. Occasionally however he touches the real integration of the plant community and its environment. This usually occurs in the sections on soils. Examples of such passages are those on soils in the sections on the Boreal Forest and on the North American Prairies.

Eyre gives great attention to the nutrient cycle in his treatment of soils, as pointed out by Philip L. Wagner in another review of Eyre's book.[2] The reader will find the present review complementary to rather than repetitive of the review by Wagner, because Wagner gives more attention to soils and less to vegetation than does the present reviewer.

The author's arguments in favor of the utility of the concept of the climatic climax in the classification and mapping of vegetation are valid (pp. 21-24). However, his rather dogmatic application of this concept reveals its limitations. This is superbly illustrated by his treatment of certain so-called fire subclimaxes, notably : pine dominance in the Southern Pine Forest (p. 63), Douglas fir dominance in the Douglas fir section of the Pacific Forest (p. 61), and prairie grass in the Prairie Peninsula (pp. 113-116). The author is so concerned with proving what the forest of the Coastal Plain would be like in the absence of fire, for example, that he never gets around to studying the real pine-sand-fire-humid subtropical ecosystem. The sandy soils of the Coastal Plain, which dry out rapidly in spite of the heavy rainfall, favor fire just as they favor pine. The intensely dry summers of the Pacific Coast of the United States favor fire just as they favor the drought-hardy Douglas fir. To imagine the Pacific Coast without summer fires is as ridiculous as to postulate it without winter rain. The dryness of the Prairie Peninsula, compared to the areas northeast and southeast of it, seems to be due mainly to more frequent dominance of warm, dry, continental air from the foot of the Rockies. As Borchert[3] concluded, « Thus the Grassland climates favor fire, just as they favor grass whether there are fires or not » (p. 39). *Wherever seasonal or occasional drought (which favors the starting of fire) is combined with relatively dense vegetation (which, unlike desert vegetation, permits the fire to carry readily), the plant community which can withstand dryness and which can reproduce in spite of, or immediately after, fire is necessarily going to be an important element of the landscape.* Result : pine on the Coastal Plain, Douglas fir on the Pacific Coast, and prairie in the Prairie Peninsula. The author's over-reliance on the concept of the climatic climax, a tradition that we have inherited from botany, is only a minor blemish of the book, however.

Unfortunately, *Vegetation and Soils* has some much more serious failings. One of the greatest of these results from an untenable interpretation of the concept of the *ecotone*. A glance at several ecology texts reveals such divergence of opinion concerning the idea of the ecotone that no attempt to clarify it can be attempted here. Eyre defines the ecotone as « the zone of competition between two distinct plant communities » (p. 306), and he proceeds to interpret most of the mixed forests of middle latitudes as ecotones (pp. 65-70) ! The resulting confusion is appalling in so far as the mixed forest of northeastern United States and adjacent

[2] *Geographical Review*, **54** : 305-307, 1964.

[3] BORCHERT, John R., « The Climate of the North American Grassland, » in *Annals Assoc. Amer. Geogs.*, **40** : 1-39, 1950.

Canada is concerned (pp. 59-60, 69-70, map five). The author's misinterpretation of this forest can be dispelled by even a cursory glance at the research of Shantz and Zon, Nichols, Braun, Oosting, and Rowe.[4] The forest in question is a separate vegetational region with a distinctive climatic climax.

Nichols and Miss Braun called this forest the Hemlock-White Pine-Northern Hardwood Region. Oosting called it the Hemlock-Hardwood Forest. The reviewer has called it *la forêt mixte Grands-Lacs – Saint-Laurent* (Great Lakes – St. Lawrence Mixed Forest).[5] All referred to the same forest region with surprisingly minor differences in boundaries.

The climax of this region is the sugar maple-beech-yellow birch-hemlock-white pine group of communities. Oosting considered this climax to be a single association. More thorough research by Dansereau and Grandtner has shown that it is a group of closely allied *érablières* (maple associations), each probably being dominant in a different section of the forest.[6] It should be observed that the associations of this group are mixed deciduous-coniferous associations. Two of the key species (hemlock and white pine) are conifers ; and, in addition, balsam fir may be a member of these communites. These associations are clearly distinct from the beech-maple association of the Eastern Deciduous Forest. The mixed character of the Great Lakes – St. Lawrence Mixed Forest is further derived from the fact that several of the successional communities and physiographic climaxes are coniferous. This forest is clearly a « climatic climax » region ; in the light of the abundant research, it is unthinkable to portray it as being mostly an ecotone.

Another major shortcoming of the book is the failure to clearly bring out the distinction between tall-grass prairie and short-grass steppe, either in the text or on the maps. The two words are used indiscriminately in the book, both prairie and short-grass steppe being called « prairies » in North America and « steppes » in the Soviet Union. It is unfortunate that these two distinctive types of vegetation are blurred in Eyre's book. The ecological difference between the prairie environment and the steppe environment can scarcely be overemphasized, and the tragic history of the American Great Plains is proof of that. Cultivation succeeded from the first in the prairie ; it never succeeded permanently in the short-grass steppe until modern dry-farming techniques were put into practice.

The numerous small mistakes are a third important drawback of the book. The sections on North America are sprinkled with annoying errors, and one is therefore led to suspect that the same is true of the sections on other parts of the world. The author states that Englemann spruce occurs « throughout » the subalpine forests of North America except in California (p. 59). This species, though common in the Rocky Mountains, is in fact completely unimportant in one of the major forest regions of the West — the Pacific Forest. We are told that the rainfall in the Northern Rockies is « much more evenly distributed throughout the year than is the rainfall in the coastal regions » (p. 61), when this is simply not the case. The author refers to a montane forest interposed between the subalpine forest and the « coast forest » on the western side of the Cascades between 2,000 and 6,000 feet (p. 62). The truth is that the hemlock-red cedar-Douglas fir zone, the same forest which is found in the lowlands and which Eyre calls

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[4] SHANTZ, Henry L., and ZON, Raphael, *Atlas of American Agriculture : IV, Natural Vegetation.* Washington, U.S. Government Printing Office, 1924.

NICHOLS, G. E., The Hemlock-White Pine-Northern Hardwood Region of North America, in *Ecology*, **16** : 403-422, 1935.

BRAUN, E. Lucy, *Deciduous Forests of Eastern North America.* Philadelphia, Blakiston Co., 1950.

OOSTING, Henry J., *The Study of Plant Communities.* San Francisco, W. H. Freeman, 1956.

ROWE, J. S., *Forest Regions of Canada.* Canada, Department of Northern Affairs and National Resources, Forestry Branch. Ottawa, Queen's Printer, 1959.

[5] CROWLEY, John M., *Les rapports entre la géographie globale, la biogéographie et l'écologie.* T. I. G. U. L., n° 13, pp. E1-E6, Québec, 1963.

[6] DANSEREAU, Pierre, *Phytogeographica Laurentiana : II. The Principal Plant Associations of the Saint Lawrence Valley.* Contributions Inst. Bot. Univ. Montréal, n° 75, 1959. Also several other publications by Dansereau.

GRANDTNER, Miroslav M., *La végétation forestière du Québec méridional.* Doctoral thesis, Université catholique de Louvain (Belgique), 1952.

the « coast forest, » is in contact with the subalpine forest of the Cascades. Sugar pine, incense cedar, and Jeffrey pine are not mentioned in the discussion of the montane forest of the Sierra Nevada (p. 62). This is inconceivable, for these giant conifers, along with Douglas fir, are the dominant trees of that forest. The term « pine barrens » is used to refer to all of the pine forests of southeastern United States (p. 62), when it is appropriate only for those areas characterized by the scrub pines. Yellow birch (*Betula lutea*) is said to « occur almost universally » in the « subsere on burned-over areas » of the American deciduous summer forest. This birch is, in fact, a characteristic tree of the Great Lakes – St. Lawrence Mixed Forest where it has climax status. It wanders into the deciduous forest only along the latter's northern limit and along the Appalachians. And so it goes page after page. Admittedly, each of these errors is perhaps of minor importance on a world scale, but in combination they detract appreciably from the value of the book.

The reviewer is disturbed even more by the flagrant lack of documentation than by the abundance of obvious mistakes. The bibliography contains only 26 items, which is incredible for a work which embraces the entire world and must necessarily be based largely upon the research of others. The author's criteria for documentation and for the choice of titles in the bibliography are a mystery. On the one hand, the author makes strong assertions about highly controversial matters without even so much as a footnote. On the other hand, he documents such a well-known fact as the height of the tallest redwood (p. 61). No documentation whatever is given for the information shown on the vegetation maps. The bibliography does not include such comprehensive studies as those cited earlier of Braun and of Shantz and Zon, while it contains some highly specialized studies, such as « Ringlinglow Bog, near Sheffield. »

In conclusion, Eyre's *Vegetation and Soils* attempts to fill a giant gap in the literature of ecology and biogeography, and the author deserves a great deal of credit for this pioneer effort. However, the reviewer must frankly admit that his initial enthusiasm about the book has been considerably dampened by its serious shortcomings.

John M. CROWLEY

CARRIÈRE, Françoise, et PINCHEMEL, Philippe. **Le fait urbain en France.** Paris, Colin, 1963, 374 pages, 41 figures.

Les études de géographie urbaine comparative, qui se multiplient depuis quelques années, sont en voie de renouveler la géographie urbaine et d'en faire l'une des branches les plus dynamiques de la géographie. S'appuyant largement sur la statistique et sur la cartographie, elles se font aussi bien à l'échelle d'une région, d'un pays ou d'un continent, et contribuent ainsi non seulement à la géographie régionale, puisqu'elles sont à la base de la compréhension de l'organisation régionale, mais aussi à la géographie générale, car, d'une part, elles permettent la formulation ou la précision de notions générales comme celles de réseau urbain ou de fonctions banales et spécifiques, et, d'autre part, elles fournissent des moyens de comparer avec exactitude les diverses villes du monde.

L'étude de Carrière et Pinchemel est un très bon exemple d'un type d'étude comparative des villes. Que nous apprend-elle sur le fait urbain français ? Elle met d'abord en lumière la disposition périphérique des principales régions urbanisées de la France et le fait que les villes françaises sont surtout des villes de plaine, de fleuve, de côte ; elle révèle aussi que la France, pays relativement peu urbanisé et à prédominance de petites villes, contient une série de réseaux urbains régionaux discontinus et plus ou moins structurés. On y apprend ensuite que la croissance urbaine en France a été très localisée ; que peu de villes sont nées de l'industrie, et que la révolution industrielle a simplement favorisé la concentration de la population dans les grandes villes, en particulier dans Paris. Un autre trait majeur des villes françaises que les auteurs font particulièrement ressortir est la très grande diversité de leurs types, à l'échelle de la région, aussi bien sur le plan de l'évolution démographique que sur celui des structures professionnelles et donc des fonctions ; mais, à travers cette variété de spécialisations, il est évident que ce sont les villes tertiaires qui dominent, la révolution industrielle n'ayant profité qu'à quelques villes. Ces quelques traits d'ensemble des villes françaises, sur lesquels les auteurs insistent dans leur conclu-